Amendments to the Claims

The listing of claims below will replace all prior versions and listings of claims in the present application.

Claim Listing

1. (Original) A method of negotiating point-to-point protocol (PPP), the method comprising:

receiving a first configuration request packet at a first network element for a network connection from a second network element;

responding with a first packet; and

if a first response to said first packet is expected by said first network element,

determining expected contents of said first response, and

if said expected contents of said first response to said first packet require a response,

responding with a second packet before receiving said first response.

2. (Currently Amended) The method of claim 1, further comprising:

sending a second configuration request packet to said second network element.

3. (Original) The method of claim 1, further comprising:

if said first configuration request packet includes at least one unsupported option,

responding with a configuration reject packet.

4. (Original) The method of claim 3, further comprising:

if said first configuration request packet includes at least one supported option having at least one unsupported value,

responding with at least one configuration-NAK packet for said supported option having at least one unsupported value.

5. (Original) The method of claim 4, wherein said configuration-NAK packet includes at least one suggested supported value for said supported option having at least one unsupported value.

6. (Currently Amended) The method of claim ~~4~~ 5, further comprising:
responding with a first configuration-ACK packet having said supported option with said suggested supported value before receiving a response to said configuration-NAK packet.

7. (Original) The method of claim 6, further comprising:
starting a re-send timer.

8. (Original) The method of claim 7, wherein a value of said re-send timer is dynamically determined according to a network traffic condition.

9. (Original) The method of claim 7, further comprising:
setting a state of said network connection to 'ACK-sent' after sending said first configuration-ACK packet.

10. (Currently Amended) The method of claim 7, further comprising:
setting ~~said~~ a state of said network connection to 'open' after sending said first configuration-ACK packet.

11. (Original) The method of claim 8, further comprising:
if said re-send timer expires before a response to said second configuration request packet is received,
re-sending said first configuration-ACK packet,
restarting said re-send timer, and
repeating said steps of re-sending and restarting until said response to said second configuration request packet is received.

12. (Original) The method of claim 11, further comprising:
if said response to said second configuration request packet is received,
analyzing said response to said second configuration request packet.

13. (Original) The method of claim 12, further comprising:
if said response to said second configuration request packet is a second configuration-ACK packet,
setting said state of said network connection to 'open', and
discarding any further responses.

14. (Currently Amended) The method of claim 12, further comprising:
if said response to said second configuration request packet is not ~~said~~ a second configuration-ACK packet,
resetting said state of said network connection, and
initiating conventional PPP negotiation.

15. (Currently Amended) The method of claim 10, further comprising:
if said re-send timer expires before ~~said~~ a response to said second configuration request packet is received,
re-sending said first configuration-ACK packet,
resetting said state of said network connection to 'ACK-sent',
restarting said re-send timer, and
repeating said steps of re-sending and restarting until said response to said second configuration request packet is received.

16. (Original) The method of claim 15, further comprising:
if said response to said second configuration request packet is received,
analyzing said response to said second configuration request packet.

17. (Original) The method of claim 16, further comprising:
if said response to said second configuration request packet is said second configuration-ACK packet,
determining said state of said network connection, and
if said state of said network connection is not set to 'open',
setting said state of said network connection to 'open'.

18. (Original) The method of claim 17, further comprising:
discarding any further responses.

19. (Original) The method of claim 16, further comprising:
if said response to said second configuration request packet is not said second configuration-ACK packet,
resetting said state of said network connection.

20. (Original) A network element comprising:
means for receiving a first configuration request packet at a first network element for a network connection from a second network element;
means for responding with a first packet;
means for determining expected contents of said first response if a first response to said first packet is expected by said first network element; and
means for responding with a second packet before receiving said first response if said expected contents of said first response to said first packet require a response.

21. (Currently Amended) The network element of claim 20, further comprising:
means for sending a second configuration request packet to said second network element.

22. (Original) The network element of claim 20, further comprising:
means for responding with a configuration reject packet if said first configuration request packet includes at least one unsupported option.

23. (Original) The network element of claim 22, further comprising:
means for responding with at least one configuration-NAK packet for said supported option having at least one unsupported value if said first configuration request packet includes at least one supported option having at least one unsupported value.

24. (Original) The network element of claim 23, wherein said configuration-NAK packet includes at least one suggested supported value for said supported option having at least one unsupported value.

25. (Currently Amended) The network element of claim ~~23~~ 24, further comprising:
means for responding with a first configuration-ACK packet having said supported option with said suggested supported value before receiving a response to said configuration-NAK packet.

26. (Original) The network element of claim 25, further comprising:
means for starting a re-send timer.

27. (Original) The network element of claim 26, wherein a value of said re-send timer is dynamically determined according to a network traffic condition.

28. (Original) The network element of claim 26, further comprising:
means for setting a state of said network connection to 'ACK-sent' after sending said first configuration-ACK packet.

29. (Currently Amended) The network element of claim 26, further comprising:
means for setting ~~said~~ a state of said network connection to 'open' after sending said first configuration-ACK packet.

30. (Original) The network element of claim 27, further comprising:
means for re-sending said first configuration-ACK packet if said re-send timer expires before a response to said second configuration request packet is received;
means for restarting said re-send timer if said re-send timer expires before a response to said second configuration request packet is received; and
means for repeating said steps of re-sending and restarting until said response to said second configuration request packet is received if said re-send timer expires before a response to said second configuration request packet is received.

31. (Original) The network element of claim 30, further comprising:
means for analyzing said response to said second configuration request packet if said response to said second configuration request packet is received.

32. (Original) The network element of claim 31, further comprising:
means for setting said state of said network connection to 'open' if said response to said second configuration request packet is a second configuration-ACK packet; and
means for discarding any further responses if said response to said second configuration request packet is a second configuration-ACK packet.

33. (Currently Amended) The network element of claim 31, further comprising:
means for resetting said state of said network connection if said response to said second configuration request packet is not ~~said~~ a second configuration-ACK packet; and

means for initiating conventional PPP negotiation if said response to said second configuration request packet is not said second configuration-ACK packet.

34. (Currently Amended) The network element of claim 29, further comprising:
means for re-sending said first configuration-ACK packet if said re-send timer expires before ~~said~~ a response to said second configuration request packet is received;
means for resetting said state of said network connection to 'ACK-sent' if said re-send timer expires before said response to said second configuration request packet is received;
means for restarting said re-send timer if said re-send timer expires before said response to said second configuration request packet is received; and
means for repeating said steps of re-sending and restarting until said response to said second configuration request packet is received if said re-send timer expires before said response to said second configuration request packet is received.

35. (Original) The network element of claim 34, further comprising:
means for analyzing said response to said second configuration request packet if said response to said second configuration request packet is received.

36. (Original) The network element of claim 35, further comprising:
means for determining said state of said network connection if said response to said second configuration request packet is said second configuration-ACK packet; and
means for setting said state of said network connection to 'open' if said state of said network connection is not set to 'open'.

37. (Original) The network element of claim 36, further comprising:
means for discarding any further responses.

38. (Currently Amended) The network element of claim ~~16~~ 35, further comprising:

means for resetting said state of said network connection if said response to said second configuration request packet is not said second configuration-ACK packet.

39. (Original) A network element comprising:

a processor; and

a network interface coupled to said processor, wherein said processor is configured to

receive a first configuration request packet at a first network element for a network connection from a second network element,

respond with a first packet, and

if a first response to said first packet is expected by said first network element,

determine expected contents of said first response, and

if said expected contents of said first response to said first packet require a response,

respond with a second packet before receiving said first response.

40. (Currently Amended) The network element of claim 39, wherein said processor is further configured to

sending a second configuration request packet to said second network element.

41. (Original) The network element of claim 39, wherein said processor is further configured to

respond with a configuration reject packet if said first configuration request packet includes at least one unsupported option.

42. (Currently Amended) The network element of claim ~~3~~ 41, wherein said processor is further configured to

respond with at least one configuration-NAK packet for said supported option having at least one unsupported value if said first configuration request packet includes at least one supported option having at least one unsupported value.

43. (Original) The network element of claim 42, wherein said configuration-NAK packet includes at least one suggested supported value for said supported option having at least one unsupported value.

44. (Currently Amended) The network element of claim ~~42~~ 43, wherein said processor is further configured to

respond with a first configuration-ACK packet having said supported option with said suggested supported value before receiving a response to said configuration-NAK packet.

45. (Currently Amended) The network element of claim ~~6~~ 44, wherein said processor is further configured to

start a re-send timer.

46. (Original) The network element of claim 45, wherein a value of said re-send timer is dynamically determined according to a network traffic condition.

47. (Original) The network element of claim 45, wherein said processor is further configured to

set a state of said network connection to 'ACK-sent' after sending said first configuration-ACK packet.

48. (Currently Amended) The network element of claim 45, wherein said processor is further configured to

set ~~said~~ a state of said network connection to 'open' after sending said first configuration-ACK packet.

49. (Original) The network element of claim 46, wherein said processor is further configured to

re-send said first configuration-ACK packet if said re-send timer expires before a response to said second configuration request packet is received;

restart said re-send timer if said re-send timer expires before a response to said second configuration request packet is received; and

repeat said steps of re-sending and restarting until said response to said second configuration request packet is received if said re-send timer expires before a response to said second configuration request packet is received.

50. (Original) The network element of claim 49, wherein said processor is further configured to

analyze said response to said second configuration request packet if said response to said second configuration request packet is received.

51. (Original) The network element of claim 50, wherein said processor is further configured to

set said state of said network connection to 'open' if said response to said second configuration request packet is a second configuration-ACK packet; and

discard any further responses if said response to said second configuration request packet is a second configuration-ACK packet.

52. (Currently Amended) The network element of claim 50, wherein said processor is further configured to

reset said state of said network connection if said response to said second configuration request packet is not ~~said~~ a second configuration-ACK packet; and

initiate conventional PPP negotiation if said response to said second configuration request packet is not said second configuration-ACK packet.

53. (Currently Amended) The network element of claim 48, wherein said processor is further configured to

re-send said first configuration-ACK packet if said re-send timer expires before ~~said~~ a response to said second configuration request packet is received;

reset said state of said network connection to 'ACK-sent' if said re-send timer expires before said response to said second configuration request packet is received;

restart said re-send timer if said re-send timer expires before said response to said second configuration request packet is received; and

repeat said steps of re-sending and restarting until said response to said second configuration request packet is received if said re-send timer expires before said response to said second configuration request packet is received.

54. (Original) The network element of claim 53, wherein said processor is further configured to

analyze said response to said second configuration request packet if said response to said second configuration request packet is received.

55. (Original) The network element of claim 54, wherein said processor is further configured to

determine said state of said network connection if said response to said second configuration request packet is said second configuration-ACK packet; and

set said state of said network connection to 'open' if said state of said network connection is not set to 'open'.

56. (Original) The network element of claim 55, wherein said processor is further configured to

discard any further responses.

57. (Original) The network element of claim 54, wherein said processor is further configured to

reset said state of said network connection if said response to said second configuration request packet is not said second configuration-ACK packet.

58. (Original) A computer program product for negotiating point-to-point protocol (PPP), encoded in computer readable media, said program product comprising a set of instructions executable on a computer system, wherein said set of instructions configured to

receive a first configuration request packet at a first network element for a network connection from a second network element;

respond with a first packet; and

if a first response to said first packet is expected by said first network element,

determine expected contents of said first response, and

if said expected contents of said first response to said first packet require a response,

respond with a second packet before receiving said first response.

59. (Currently Amended) The computer program product of claim 58, wherein said set of instructions is further configured to

send a second configuration request packet to said second network element.

60. (Original) The computer program product of claim 58, wherein said set of instructions is further configured to

if said first configuration request packet includes at least one unsupported option,

respond with a configuration reject packet.

61. (Original) The computer program product of claim 60, wherein said set of instructions is further configured to

if said first configuration request packet includes at least one supported option having at least one unsupported value,

respond with at least one configuration-NAK packet for said supported option having at least one unsupported value.

62. (Original) The computer program product of claim 61, wherein said configuration-NAK packet includes at least one suggested supported value for said supported option having at least one unsupported value.

63. (Currently Amended) The computer program product of claim ~~61~~ 62, wherein said set of instructions is further configured to

respond with a first configuration-ACK packet having said supported option with said suggested supported value before receiving a response to said configuration-NAK packet.

64. (Original) The computer program product of claim 63, wherein said set of instructions is further configured to

start a re-send timer.

65. (Original) The computer program product of claim 64, wherein a value of said re-send timer is dynamically determined according to a network traffic condition.

66. (Original) The computer program product of claim 64, wherein said set of instructions is further configured to

set a state of said network connection to 'ACK-sent' after sending said first configuration-ACK packet.

67. (Currently Amended) The computer program product of claim 64, wherein said set of instructions is further configured to

set ~~said~~ a state of said network connection to 'open' after sending said first configuration-ACK packet.

68. (Original) The computer program product of claim 65, wherein said set of instructions is further configured to

if said re-send timer expires before a response to said second configuration request packet is received,

re-send said first configuration-ACK packet,

restart said re-send timer, and

repeat said steps of re-sending and restarting until said response to said second configuration request packet is received.

69. (Original) The computer program product of claim 68, wherein said set of instructions is further configured to

if said response to said second configuration request packet is received,

analyze said response to said second configuration request packet.

70. (Original) The computer program product of claim 69, wherein said set of instructions is further configured to

if said response to said second configuration request packet is a second configuration-ACK packet,

set said state of said network connection to 'open', and
discard any further responses.

71. (Currently Amended) The computer program product of claim 69, wherein said set of instructions is further configured to
if said response to said second configuration request packet is not ~~said~~ a second configuration-ACK packet,
reset said state of said network connection, and
initiate conventional PPP negotiation.

72. (Currently Amended) The computer program product of claim 67, wherein said set of instructions is further configured to
if said re-send timer expires before ~~said~~ a response to said second configuration request packet is received,
re-send said first configuration-ACK packet,
reset said state of said network connection to 'ACK-sent',
restart said re-send timer, and
repeat said steps of re-sending and restarting until said response to said second configuration request packet is received.

73. (Original) The computer program product of claim 72, wherein said set of instructions is further configured to
if said response to said second configuration request packet is received,
analyze said response to said second configuration request packet.

74. (Original) The computer program product of claim 73, wherein said set of instructions is further configured to
if said response to said second configuration request packet is said second configuration-ACK packet,
determine said state of said network connection, and
if said state of said network connection is not set to 'open',
set said state of said network connection to 'open'.

75. (Original) The computer program product of claim 74, wherein said set of instructions is further configured to

discard any further responses.

76. (Original) The computer program product of claim 73, wherein said set of instructions is further configured to

if said response to said second configuration request packet is not said second configuration-ACK packet,

reset said state of said network connection